

LLNL Environmental Restoration Division (ERD)
Standard Operating Procedure (SOP)

**ERD SOP 2.2: Field Measurements on Surface and Ground
Waters—Revision: 4**



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1.0 PURPOSE

The purpose of this procedure is to ensure that water chemistry measurements on surface and ground water (i.e., pH, temperature, specific conductance, and water-level measurement) are properly performed and documented

2.0 APPLICABILITY

This procedure is applicable when performing field collection and measurement of water quality parameters during ground water monitoring activities and special studies.

3.0 REFERENCES

- 3.1 Korte, N. and P. Kearl (1984), "Procedures for the Collection and Preservation of Groundwater and Surface Water Samples and for the Instal Department of Energy," Grand Junction, Colo.
- 3.2 U.S. EPA (1979), *Methods for Chemical Analysis of Water and Wastes*, Washington, D.C. (EPA-600/4-79-020).

Procedure No. ERD SOP-2.2	Revision Number 4	Page 2 of 6
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- 3.3 U.S. EPA (1992), *RCRA Ground-Water Monitoring: Draft Technical Guidance*, Washington, D.C. (EPA/530-R-93-001).

4.0 DEFINITIONS

See SOP Glossary.

5.0 RESPONSIBILITIES

5.1 Division Leader

The Division Leader's responsibility is to ensure that all activities performed by ERD at the Livermore Site and Site 300 are performed safely and comply with all pertinent regulations and procedures, and provide the necessary equipment and resources to accomplish the tasks described in this procedure.

5.2 Field Personnel

The field personnel's responsibility is to collect and measure water quality parameters during sampling activities according to the guidelines herein.

5.3 Sample Coordinator (SC)

The SC's responsibilities are to review the incoming LLNL Ground Water Sampling Logs.

5.4 Subproject Leader (SL)

The SL is responsible for the overall investigation, planning, and assessment and remediation within a study or treatment facility area.

6.0 PROCEDURE

6.1 When to Collect Field Measurements

- 6.1.1 Quarterly Ground Water Sampling. The quarterly Sampling Plan provided by the SC to the field personnel for routine ground water sampling declares the number and identification of wells for which field chemistry measurements need to be obtained, as well as other purging and sampling information.
- 6.1.2 Treatment Facility Sampling. The sampling schedule for treatment facilities determined by waste discharge permits declares the location and frequency for field chemistry measurements that need to be taken. An SL will provide this information for non-routine sampling points.
- 6.1.3 Special Studies. During special studies, field measurements may be collected per the experiment plan.

6.2 Field Instrument Calibration/Maintenance

- 6.2.1 Assemble the appropriate water sampling equipment and field chemistry instrumentation according to Attachment A. Check to ensure that equipment and instruments are properly working.

Procedure No. ERD SOP-2.2	Revision Number 4	Page 3 of 6
------------------------------	----------------------	-------------

- 6.2.2 Perform required maintenance according to SOP 4.8, "Calibration/Verification and Maintenance of Measuring and Test Equipment (M&TE).
- 6.2.3 Calibrate or verify the calibration of field chemistry instrumentation according to SOP 4.8. Use calibrated instruments only.

6.3 Field Measurements

- 6.3.1 Field Measurement Documentation. Initiate the proper sample documentation as described in SOP 4.2, "Sample Control and Documentation." The following data fields should be filled in on the Ground Water Sampling Data Sheet and/or in the appropriate field logbook when collecting water chemistry measurements using the following instruments:
 - A. Specific Conductance Meter ID. Identification, model, or serial number of specific conductivity meter being used.
 - B. pH Meter ID. Identification, model, or serial number of pH meter being used.
- 6.3.2 Collecting Field Measurements
 - A. pH Measurements
Take pH measurements per instrument operating instructions. pH paper may be used when applicable.
 - B. Temperature
Temperature readings are usually obtained from the temperature probe used to compensate the pH measurements and can be read directly off the pH meter. A separate temperature probe may be used and should read to the 0.1°C.
 - C. Specific Conductivity (SC)
Measure conductivity in a clean container that has been rinsed with the liquid to be sampled or using a flow-through cell per operator instructions.
 - D. Dissolved Oxygen (DO)
Measure dissolved oxygen per instrument operating instructions.
 - E. Oxidation/Reduction Potential (ORP)
Measure oxidation/reduction potential per instrument operating instructions.
 - F. Depth to Water
Measure depth to water per SOP 3.1, "Water-Level Measurements."
- 6.3.4 Decontaminate instrument as described in SOP 4.5, "General Equipment Decontamination."
- 6.3.5 Inventory sampling equipment and supplies. Repair or replace all expendable, broken or damaged equipment and return to storage area.

Procedure No. ERD SOP-2.2	Revision Number 4	Page 4 of 6
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7.0 QA RECORDS

- 7.1 Document Control Logbooks
- 7.2 Ground Water Sampling Data Sheets

8.0 ATTACHMENT

Attachment A—Equipment checklist

Procedure No. ERD SOP-2.2	Revision Number 4	Page 5 of 6
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Attachment A

Equipment Checklist

Procedure No. ERD SOP-2.2	Revision Number 4	Page 6 of 6
------------------------------	----------------------	-------------

The purpose of the list presented below is to aid field personnel in identifying those supplies necessary to conduct a particular field operation. It is not intended to be all inclusive. It is the responsibility of field personnel to determine and obtain the supplies required for successful performance of assigned tasks.

Equipment Checklist

- _____ Beakers
- _____ Buffer solution
- _____ Distilled water
- _____ DO meter
- _____ ORP meter
- _____ SC meter
- _____ Gloves
- _____ KCL solution
- _____ pH meter or paper
- _____ Squirt bottle
- _____ Thermometer
- _____ Tissues
- _____ Water-level indicator